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1 ATGGCAGCTAAAGACGTAAAATTCGGTAACGACGCTCGTGTGAAAATGCTGCGCGGCGTA  
1 METAlaAlaLysAspValLysPheGlyAsnAspAlaArgValLysMETLeuArgGlyVal

61 AACGTACTGGCAGATGCAGTGAAAGTTACCCTCGGTCCGAAAGGCCGTAAACGTAGTTCTG  
21 AsnValLeuAlaAspAlaValLysValThrLeuGlyProLysGlyArgAsnValValLeu

121 GATAAATCTTTCGGTGCACCGACCATCACCAAAGATGGTGTTCCTTGCTCGTGAAATC  
41 AspLysSerPheGlyAlaProThrIleThrLysAspGlyValSerValAlaArgGluIle

181 GAACTGGAAGACAAGTTCGAAAACATGGGTGCGCAGATGGTGAAAGAAGTTGCCTCTAAA  
61 GluLeuGluAspLysPheGluAsnMETGlyAlaGlnMETValLysGluValAlaSerLys

241 GCGAACGACGCTGCAGGCGACGGTACCACCACTGCAACCGTACTGGCTCAGGCTATCATC  
81 AlaAsnAspAlaAlaGlyAspGlyThrThrThrAlaThrValLeuAlaGlnAlaIleIle

301 ACTGAAGGTCTGAAAGCTGTTGCTGCGGGCATGAACCCGATGGACCTGAAACGTGGTATC  
101 ThrGluGlyLeuLysAlaValAlaAlaGlyMETAsnProMETAspLeuLysArgGlyIle

361 GACAAAGCTGTTACCGCTGCAGTTGAAGAACTGAAAGCGCTGTCCGTACCGTGCTCTGAC  
121 AspLysAlaValThrAlaAlaValGluGluLeuLysAlaLeuSerValProCysSerAsp

421 TCTAAAGCGATTGCTCAGGTTGGTACTATCTCCGCTAACTCCGACGAAACCGTAGGTAAA  
141 SerLysAlaIleAlaGlnValGlyThrIleSerAlaAsnSerAspGluThrValGlyLys

481 CTGATCGCTGAAGCGATGGACAAAGTCGGTAAAGAAGGCGTTATCACCGTTGAAGACGGT  
161 LeuIleAlaGluAlaMETAspLysValGlyLysGluGlyValIleThrValGluAspGly

541 ACCGGTCTGCAGGACGAACTGGACGTGGTTGAAGGTATGCAGTTCGACCGTGGCTACCTG  
181 ThrGlyLeuGlnAspGluLeuAspValValGluGlyMETGlnPheAspArgGlyTyrLeu

601 TCTCCTTACTTCATCAACAAGCCGGAAGCTGGCGCAGTAGAACTGGAAAGCCCGTTCATC  
201 SerProTyrPheIleAsnLysProGluThrGlyAlaValGluLeuGluSerProPheIle

661 CTGCTGGCTGACAAGAAAATCTCCAACATCCGCGAAATGCTGCCGGTTCTGGAAGCCGTT  
221 LeuLeuAlaAspLysLysIleSerAsnIleArgGluMETLeuProValLeuGluAlaVal

721 GCCAAAGCAGGCAAACCGCTGCTGATCATCGCTGAAGATGTAGAAGGCGAAGCGCTGGCA  
241 AlaLysAlaGlyLysProLeuLeuIleIleAlaGluAspValGluGlyGluAlaLeuAla

781 ACTCTGGTTGTTAACACCATGCGTGGCATCGTGAAAGTTGCTGCAGTTAAAGCTCCGGGC  
261 ThrLeuValValAsnThrMETArgGlyIleValLysValAlaAlaValLysAlaProGly

841 TTCGGCGATCGTCGTAAAGCTATGCTGCAGGATATCGCAACCCTGACTGGCGGTACCGTA  
281 PheGlyAspArgArgLysAlaMETLeuGlnAspIleAlaThrLeuThrGlyGlyThrVal

901 ATCTCTGAAGAGATCGGTATGGAGCTGGAAAAAGCAACCCTGGAAGACCTGGGTCAGGCT  
301 IleSerGluGluIleGlyMETGluLeuGluLysAlaThrLeuGluAspLeuGlyGlnAla

961 AAACGCGTTGTGATCAACAAAGACACCACCACCATCATCGATGGCGTGGGCGAAGAAGCT  
321 LysArgValValIleAsnLysAspThrThrThrIleIleAspGlyValGlyGluGluAla

1021 GCAATCCAGGGCCGTGTTGCTCAGATCCGTCAGCAGATTGAAGAAGCAACTTCTGACTAC  
341 AlaIleGlnGlyArgValAlaGlnIleArgGlnGlnIleGluGluAlaThrSerAspTyr

FIG. 1A

[illegible]

**FIG. 1B**

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1      ATGGCAGCTAAAGACGTAAAATTCGGTAACGACGCTCGTGTGAAAATGCTGCGCGGCGTA
1      METAlaAlaLysAspValLysPheGlyAsnAspAlaArgValLysMETLeuArgGlyVal

61     AACGTACTGGCAGATGCAGTGAAAGTTACCCTCGGTCCGAAAGGCCGTAAACGTAGTTCTG
21     AsnValLeuAlaAspAlaValLysValThrLeuGlyProLysGlyArgAsnValValLeu

121    GATAAATCTTTCGGTGCACCGACCATCACCAAAGATGGTGTTTCCGTTGCTCGTGAAATC
41     AspLysSerPheGlyAlaProThrIleThrLysAspGlyValSerValAlaArgGluIle

181    GAAGTGGAAAGACAAGTTCGAAAACATGGGTGCGCAGATGGTGAAAGAAGTTGCCTCTAAA
61     GluLeuGluAspLysPheGluAsnMETGlyAlaGlnMETValLysGluValAlaSerLys

241    GCGAACGACGCTGCAGGCGACGGTACCACCACTGCAACCGTACTGGCTCAGGCTATCATC
81     AlaAsnAspAlaAlaGlyAspGlyThrThrThrAlaThrValLeuAlaGlnAlaIleIle

301    ACTGAAGGTCTGAAAGCTGTTGCTGCGGGCATGAACCCGATGGACCTGAAACGTGGTATC
101    ThrGluGlyLeuLysAlaValAlaAlaGlyMETAsnProMETAspLeuLysArgGlyIle

361    GACAAAGCTGTTACCGCTGCAGTTGAAGAACTGAAAGCGCTGTCCGTACCGTGCTCTGAC
121    AspLysAlaValThrAlaAlaValGluGluLeuLysAlaLeuSerValProCysSerAsp

421    TCTAAAGCGATTGCTCAGGTTGGTACTATCTCCGCTAACTCCGACGAAACCGTAGGTAAA
141    SerLysAlaIleAlaGlnValGlyThrIleSerAlaAsnSerAspGluThrValGlyLys

481    CTGATCGCTGAAGCGATGGACAAAGTCGGTAAAGAAGGCGTTATCACCGTTGAAGACGGT
161    LeuIleAlaGluAlaMETAspLysValGlyLysGluGlyValIleThrValGluAspGly

541    ACCGGTCTGCAGGACGAACTGGACGTGGTTGAAGGTATGCAGTTCGACCGTGGCTACCTG
181    ThrGlyLeuGlnAspGluLeuAspValValGluGlyMETGlnPheAspArgGlyTyrLeu

601    TCTCCTTACTTCATCAACAAGCCGGAAGTGGCGCAGTAGAACTGGAAAGCCCGTTCATC
201    SerProTyrPheIleAsnLysProGluThrGlyAlaValGluLeuGluSerProPheIle

661    CTGCTGGCTGACAAGAAAATCTCCAACATCCGCGAAATGCTGCCGGTTCTGGAAGCCGTT
221    LeuLeuAlaAspLysLysIleSerAsnIleArgGluMETLeuProValLeuGluAlaVal

721    GCCAAAGCAGGCAAACCGCTGCTGATCATCGCTGAAGATGTAGAAGGCGAAGCGCTGGCA
241    AlaLysAlaGlyLysProLeuLeuIleIleAlaGluAspValGluGlyGluAlaLeuAla

781    ACTCTGGTTGTTAACACCATGCGTGGCATCGTGAAAGTTGCTGCAGTTAAAGCTCCGGGC
261    ThrLeuValValAsnThrMETArgGlyIleValLysValAlaAlaValLysAlaProGly

841    TTCGGCGATCGTCGTAAAGCTATGCTGCAGGATATCGCAACCCTGACTGGCGGTACCGTA
281    PheGlyAspArgArgLysAlaMETLeuGlnAspIleAlaThrLeuThrGlyGlyThrVal

901    ATCTCTGAAGAGATCGGTATGGAGCTGGAAAAAGCAACCCTGGAAGACCTGGGTCAGGCT
301    IleSerGluGluIleGlyMETGluLeuGluLysAlaThrLeuGluAspLeuGlyGlnAla

961    AAACGCGTTGTGATCAACAAAGACACCACCACCATCATCGATGGCGTGGGCGAAGAAGCT
321    LysArgValValIleAsnLysAspThrThrThrIleIleAspGlyValGlyGluGluAla

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FIG. 2A

[illegible]

**FIG. 2B**

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1 ATGGCAGCTAAAGACGTAAAATTCTGGTAACGACGCTCGTGTGAAAATGCTGCGCGGCGTA  
1 METAlaAlaLysAspValLysPheGlyAsnAspAlaArgValLysMETLeuArgGlyVal

61 AACGTACTGGCAGATGCAGTGAAAGTTACCCTCGGTCCAAAAGGCCGTAACTAGTTCTG  
21 AsnValLeuAlaAspAlaValLysValThrLeuGlyProLysGlyArgAsnValValLeu  
121 GATAAATCTTTCGGTGCACCGACCATCACCAAAGATGGTGTTCGGTTGCTCGTGAAATC  
41 AspLysSerPheGlyAlaProThrIleThrLysAspGlyValSerValAlaArgGluIle

181 GAACTGGAAGACAAGTTCGAAAATATGGGTGCGCAGATGGTGAAAGAAGTTGCCTCTAAA  
61 GluLeuGluAspLysPheGluAsnMETGlyAlaGlnMETValLysGluValAlaSerLys

241 GCAAACGACGCTGCAGGCGACGGTACCACCACTGCAACCGTACTGGCTCAGGCTATCATC  
81 AlaAsnAspAlaAlaGlyAspGlyThrThrThrAlaThrValLeuAlaGlnAlaIleIle

301 ACTGAAGGTCTGAAAGCTGTTGCTGCGGGCATGAACCCGATGGACCTGAAACGTGGTATC  
101 ThrGluGlyLeuLysAlaValAlaAlaGlyMETAsnProMETAspLeuLysArgGlyIle

361 GACAAAGCGGTTACCGTTGCAGTTGAAGAACTGAAAGCGCTGTCCGTACCATGCTCTGAC  
121 AspLysAlaValThrValAlaValGluGluLeuLysAlaLeuSerValProCysSerAsp

421 TCTAAAGCGATTGCTCAGGTTGGTACCATCTCCGCTAACTCCGACGAAACCGTAGGTAAA  
141 SerLysAlaIleAlaGlnValGlyThrIleSerAlaAsnSerAspGluThrValGlyLys

481 CTGATCGCTGAAGCGATGGACAAAGTCGGTAAAGAAGGCGTTATCACCGTTGAAGACGGT  
161 LeuIleAlaGluAlaMETAspLysValGlyLysGluGlyValIleThrValGluAspGly

541 ACCGGTCTGCAGGACGAACTGGACGTGGTTGAAGGTATGCAGTTCGACCGTGGCTACCGT  
181 ThrGlyLeuGlnAspGluLeuAspValValGluGlyMETGlnPheAspArgGlyTyrArg

601 TATGATTACTTCATCAACAAGCCGGAAGCTGGCGCAGTAGAACTGGAAAGCCCGTTCATC  
201 TyrAspTyrPheIleAsnLysProGluThrGlyAlaValGluLeuGluSerProPheIle

661 CTGCTGGCTGACAAGAAAATCTCCAACATCCGCGAAATGCTGCCGGTTCTGGAAGCTGTT  
221 LeuLeuAlaAspLysLysIleSerAsnIleArgGluMETLeuProValLeuGluAlaVal

721 GCCAAAGCAGGCAAACCGCTGCTGATCATCGCTGAAGATGTAGAAGGCGAAGCGCTGGCA  
241 AlaLysAlaGlyLysProLeuLeuIleIleAlaGluAspValGluGlyGluAlaLeuAla

781 ACTCTGGTTGTTAACACCATGCGTGGCATCGTGAAAGTCGCTGCGGTTAAAGCACCGGGC  
261 ThrLeuValValAsnThrMETArgGlyIleValLysValAlaAlaValLysAlaProGly

841 TTCGGCGATCGTCGTAAAGCTATGCTGCAGGATATCGCAACCCTGACTGGCGGTACCGTG  
281 PheGlyAspArgArgLysAlaMETLeuGlnAspIleAlaThrLeuThrGlyGlyThrVal

901 ATCTCTGAAGAGATCGGTATGGAGCTGGAAAAAGCAACCCTGGAAGACCTGGGTCAGGCT  
301 IleSerGluGluIleGlyMETGluLeuGluLysAlaThrLeuGluAspLeuGlyGlnAla

961 AAACGTGTTGTGATCAACAAAGACACCACCACTATCATCGATGGCGTGGGTGAAGAAGCT  
321 LysArgValValIleAsnLysAspThrThrThrIleIleAspGlyValGlyGluGluAla

1021 GCAATCCAGGGCCGTGTTGCTCAGATCCGTCAGCAGATTGAAGAAGCAACTTCTGACTAC  
341 AlaIleGlnGlyArgValAlaGlnIleArgGlnGlnIleGluGluAlaThrSerAspTyr

FIG. 3A

[illegible]

**FIG. 3B**

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1      ATGGCAGCTAAAGACGTAAAATTCGGTAACGACGCTCGTGTGAAAATGCTGCGCGGCGTA
1      METAlaAlaLysAspValLysPheGlyAsnAspAlaArgValLysMETLeuArgGlyVal

61     AACGTACTGGCAGATGCAGTGAAAGTTACCCTCGGTCCGAAAGGCCGTAAACGTAGTTCTG
21     AsnValLeuAlaAspAlaValLysValThrLeuGlyProLysGlyArgAsnValValLeu

121    GATAAATCTTTCGGTGCACCGACCATCACCAAAGATGGTGTTCCTGTTGCTCGTGAAATC
41     AspLysSerPheGlyAlaProThrIleThrLysAspGlyValSerValAlaArgGluIle

181    GAACTGGAAGACAAGTTCGAAAACATGGGTGCGCAGATGGTGAAAGAAGTTGCCTCTAAA
61     GluLeuGluAspLysPheGluAsnMETGlyAlaGlnMETValLysGluValAlaSerLys

241    GCGAACGACGCTGCAGGCGACGGTACCACCCTGCAACCGTACTGGCTCAGGCTATCATC
81     AlaAsnAspAlaAlaGlyAspGlyThrThrThrAlaThrValLeuAlaGlnAlaIleIle

301    ACTGAAGGTCTGAAAGCTGTTGCTGCGGGCATGAACCCGATGGACCTGAAACGTGGTATC
101    ThrGluGlyLeuLysAlaValAlaAlaGlyMETAsnProMETAspLeuLysArgGlyIle

361    GACAAAGCTGTTACCGCTGCAGTTGAAGAACTGAAAGCGCTGTCCGTACCGTGCTCTGAC
121    AspLysAlaValThrAlaAlaValGluGluLeuLysAlaLeuSerValProCysSerAsp

421    TCTAAAGCGATTGCTCAGGTTGGTACTATCTCCGCTAACTCCGACGAAACCGTAGGTAAA
141    SerLysAlaIleAlaGlnValGlyThrIleSerAlaAsnSerAspGluThrValGlyLys

481    CTGATCGCTGAAGCGATGGACAAAGTCGGTAAAGAAGGCGTTATCACCGTTGAAGACGGT
161    LeuIleAlaGluAlaMETAspLysValGlyLysGluGlyValIleThrValGluAspGly

541    ACCGGTCTGCAGGACGAACTGGACGTGGTTGAAGGTATGCAGTTCGACCGTGGCATCCTG
181    ThrGlyLeuGlnAspGluLeuAspValValGluGlyMETGlnPheAspArgGlyIleLeu

601    TCTCCTATCTTCATCAACAAGCCGGAACCTGGCGCAGTAGAACTGGAAAGCCCGTTCATC
201    SerProIlePheIleAsnLysProGluThrGlyAlaValGluLeuGluSerProPheIle

661    CTGCTGGCTGACAAGAAAATCTCCAACATCCGCGAAATGATCCCGGTTATCGAAGCCGTT
221    LeuLeuAlaAspLysLysIleSerAsnIleArgGluMETIleProValIleGluAlaVal

721    GCCAAAGCAGGCAAACCGCTGCTGATCATCGCTGAAGATGTAGAAGGCGAAGCGTTTCGCA
241    AlaLysAlaGlyLysProLeuLeuIleIleAlaGluAspValGluGlyGluAlaPheAla

781    ACTCTGCTTTTCAACACCATGCGTGGCATCGTGAAAGTTGCTGCAGTTAAAGCTCCGGGC
261    ThrLeuLeuPheAsnThrMETArgGlyIleValLysValAlaAlaValLysAlaProGly

841    TTCGGCGATCGTCGTAAAGCTATGCTGCAGGATATCGCAACCCTGACTGGCGGTACCGTA
281    PheGlyAspArgArgLysAlaMETLeuGlnAspIleAlaThrLeuThrGlyGlyThrVal
901    ATCTCTGAAGAGATCGGTATGGAGCTGGAAAAAGCAACCCTGGAAGACCTGGGTCAGGCT
301    IleSerGluGluIleGlyMETGluLeuGluLysAlaThrLeuGluAspLeuGlyGlnAla

961    AAACGCGTTGTGATCAACAAAGACACCACCACCATCATCGATGGCGTGGGCGAAGAAGCT
321    LysArgValValIleAsnLysAspThrThrThrIleIleAspGlyValGlyGluGluAla

1021   GCAATCCAGGGCCGTGTTGCTCAGATCCGTCAGCAGATTGAAGAAGCAACTTCTGACTAC
341   AlaIleGlnGlyArgValAlaGlnIleArgGlnGlnIleGluGluAlaThrSerAspTyr

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FIG. 4A

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1081 GACCGTGAAAACTGCAGGAGCGCGTAGCGAACTGGCAGGCGGCGTTGCAGTTATCAAA  
361 AspArgGluLysLeuGlnGluArgValAlaLysLeuAlaGlyGlyValAlaValIleLys

1141 GTAGGTGCTGCTACCGAAGTTGAAATGAAAGAGAAAAAAGCACGCGTTGAAGACGCCCTG  
381 ValGlyAlaAlaThrGluValGluMETLysGluLysLysAlaArgValGluAspAlaLeu

1201 CACGCGACCCGTGCTGCGGTAGAAGAAGGCGTGGTTGCTGGTGGTGGTGGTTGCGCTGATC  
401 HisAlaThrArgAlaAlaValGluGluGlyValValAlaGlyGlyGlyValAlaLeuIle

1261 CGCGTAGCGTCTAAACTGGCTGACCTGCGTGGTCAGAACGAAGACCAGAACGTGGGTATC  
421 ArgValAlaSerLysLeuAlaAspLeuArgGlyGlnAsnGluAspGlnAsnValGlyIle

1321 AAAGTTGCACTGCGTGCAATGGAAGCTCCGCTGCGTCAGATCGTCCTGAACTGCGGCGAA  
441 LysValAlaLeuArgAlaMETGluAlaProLeuArgGlnIleValLeuAsnCysGlyGlu

1381 GAACCGTCTGTTGTTGCTAACACCGTTAAAGGCGGCGACGGCAACTACGGTTACAACGCA  
461 GluProSerValValAlaAsnThrValLysGlyGlyAspGlyAsnTyrGlyTyrAsnAla

1441 GCAACCGAAGAATACGGCAACATGATCTGCATGGGTATCCTGGACCCAACCAAAGTAACC  
481 AlaThrGluGluTyrGlyAsnMETIleCysMETGlyIleLeuAspProThrLysValThr

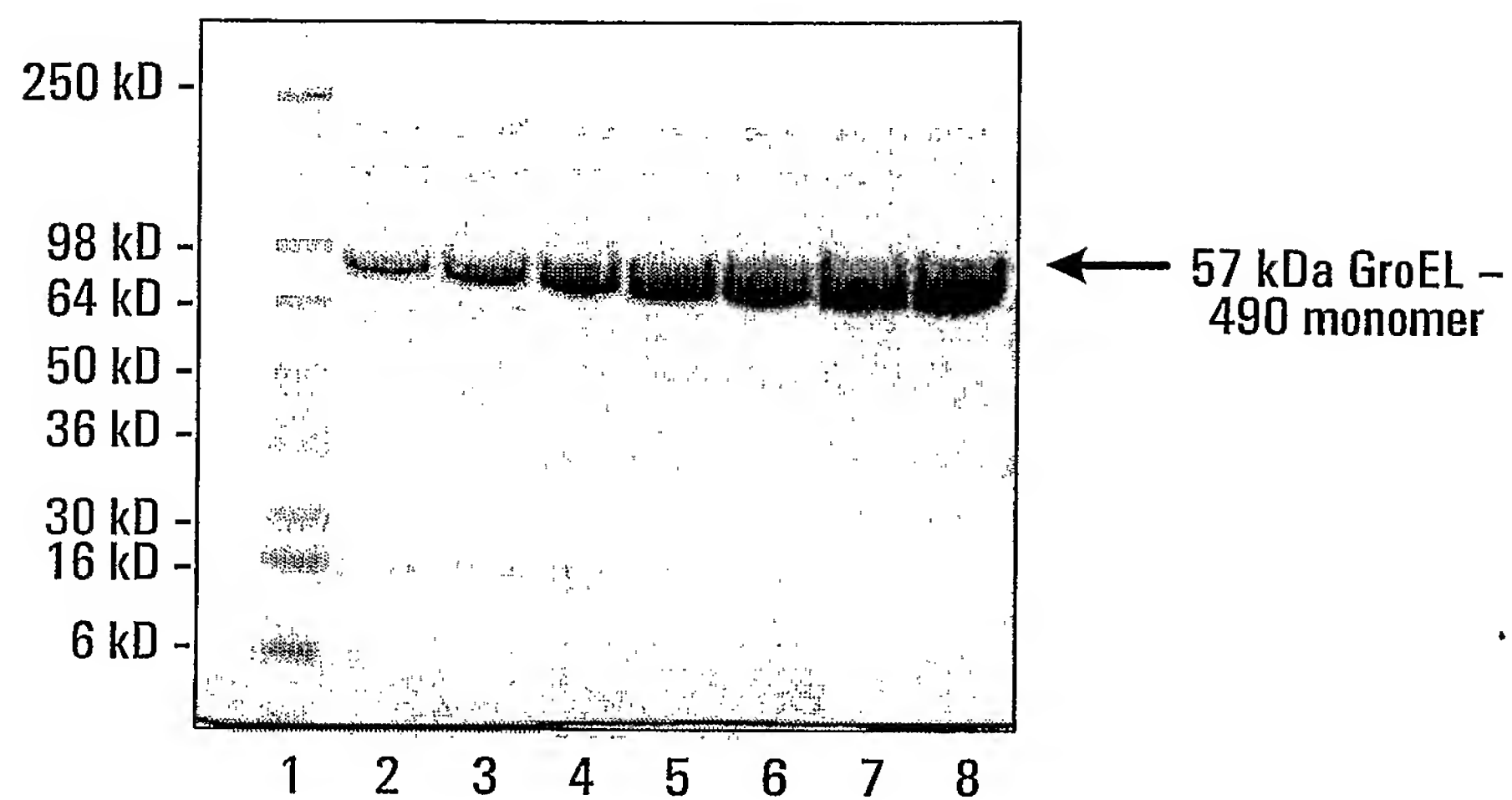
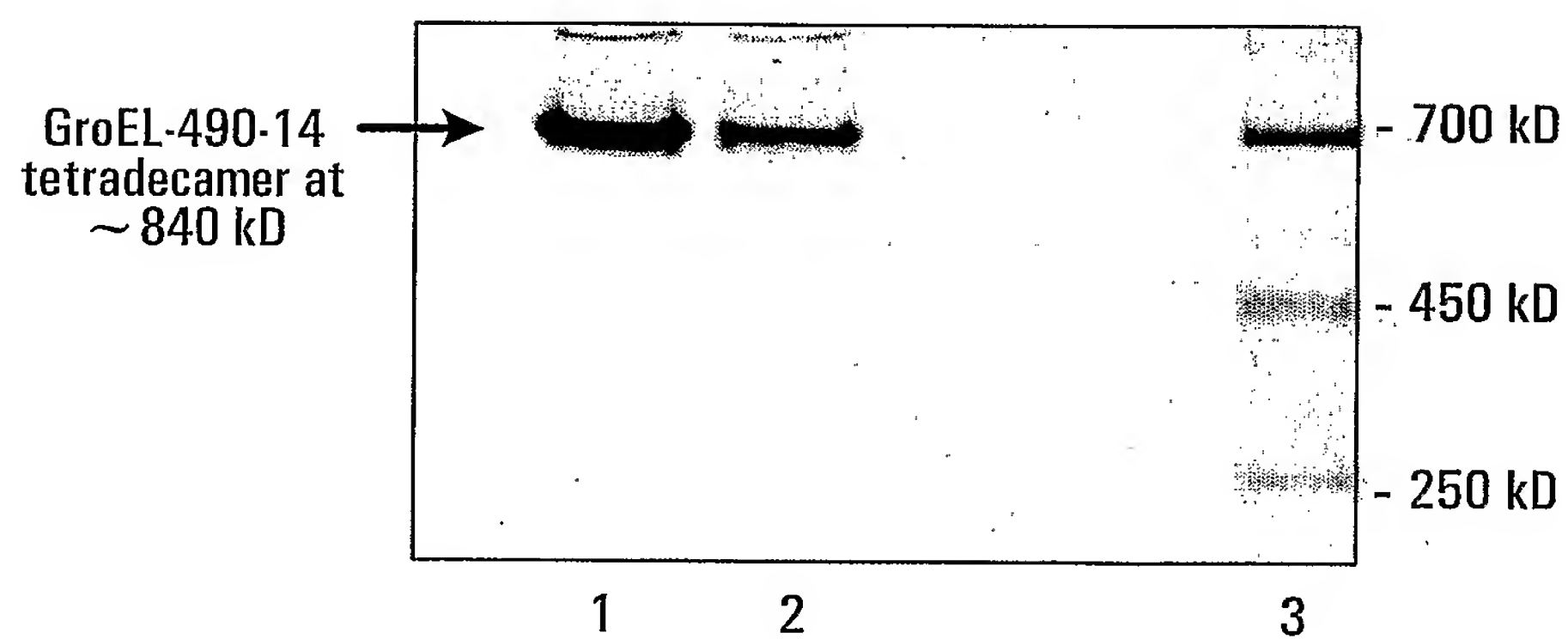
1501 CGTTCTGCTCTGCAGTACGCGGCTTCTGTGGCTGGCCTGATGATCACCACCGAATGCATG  
501 ArgSerAlaLeuGlnTyrAlaAlaSerValAlaGlyLeuMETIleThrThrGluCysMET

1561 GTTACCGACCTGCCGAAAAACGATGCAGCTGACTTAGGCGCTGCTGGCGGCATGGGTGGC  
521 ValThrAspLeuProLysAsnAspAlaAlaAspLeuGlyAlaAlaGlyGlyMETGlyGly

1621 ATGGGTGGCATGGGCGGCATGATGTAA  
541 METGlyGlyMETGlyGlyMETMET\*\*\*

FIG. 4B

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**Purified GroEL****FIG. 5****FIG. 6**

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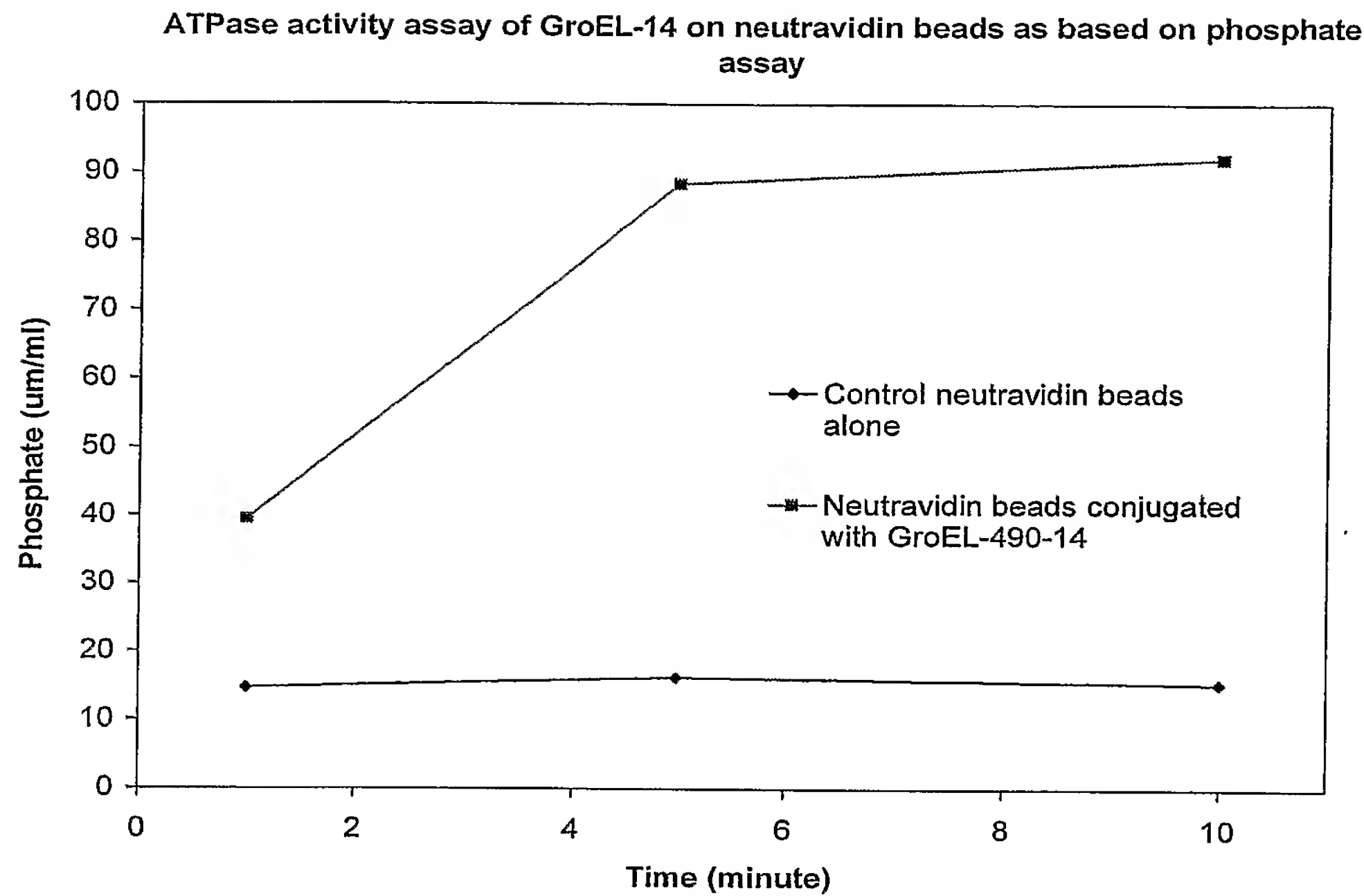


FIG. 7

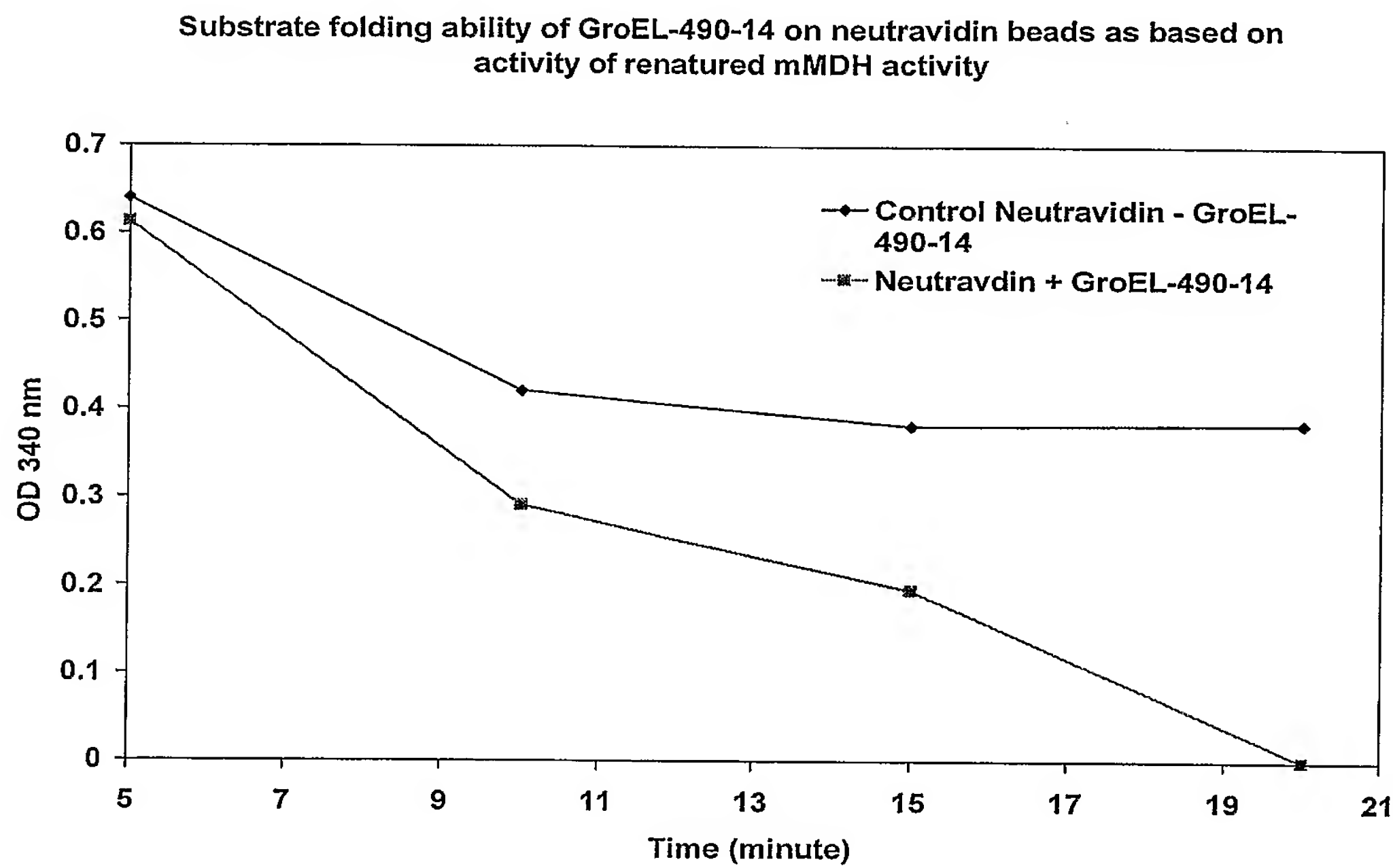
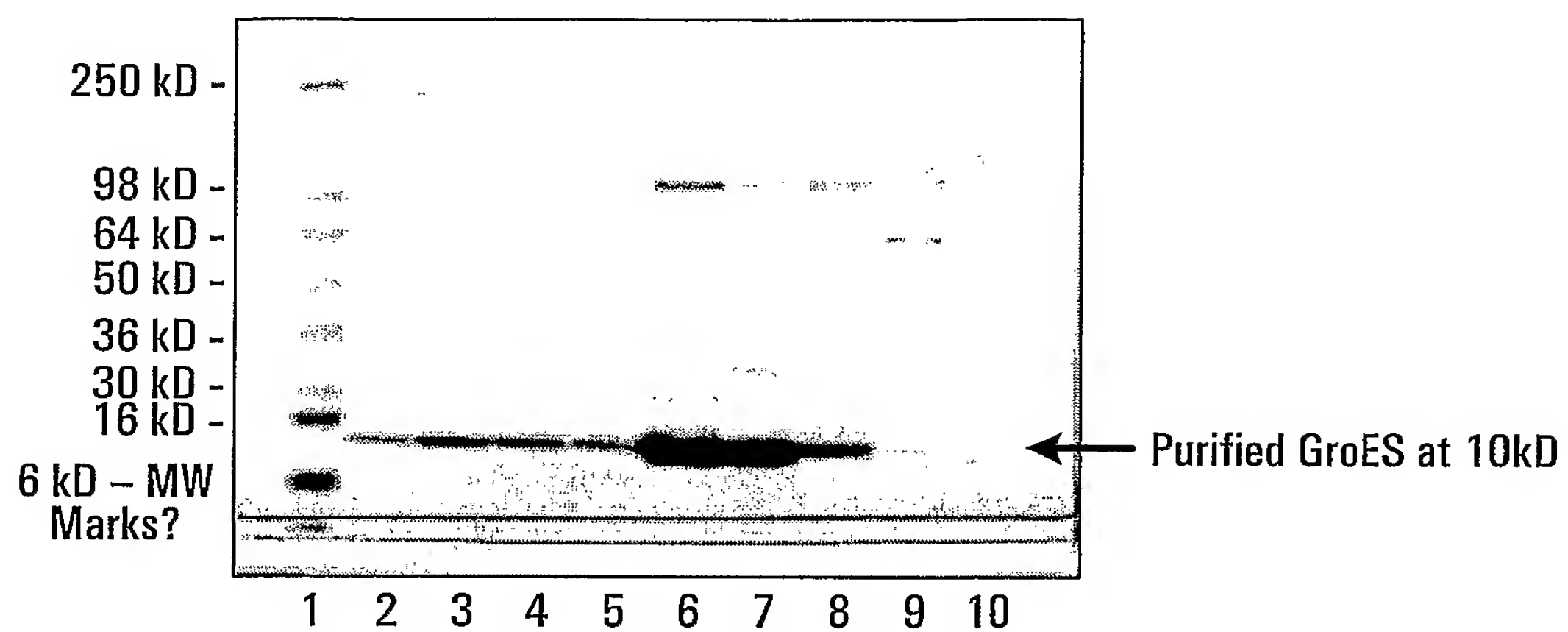


FIG. 8

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**FIG. 9**

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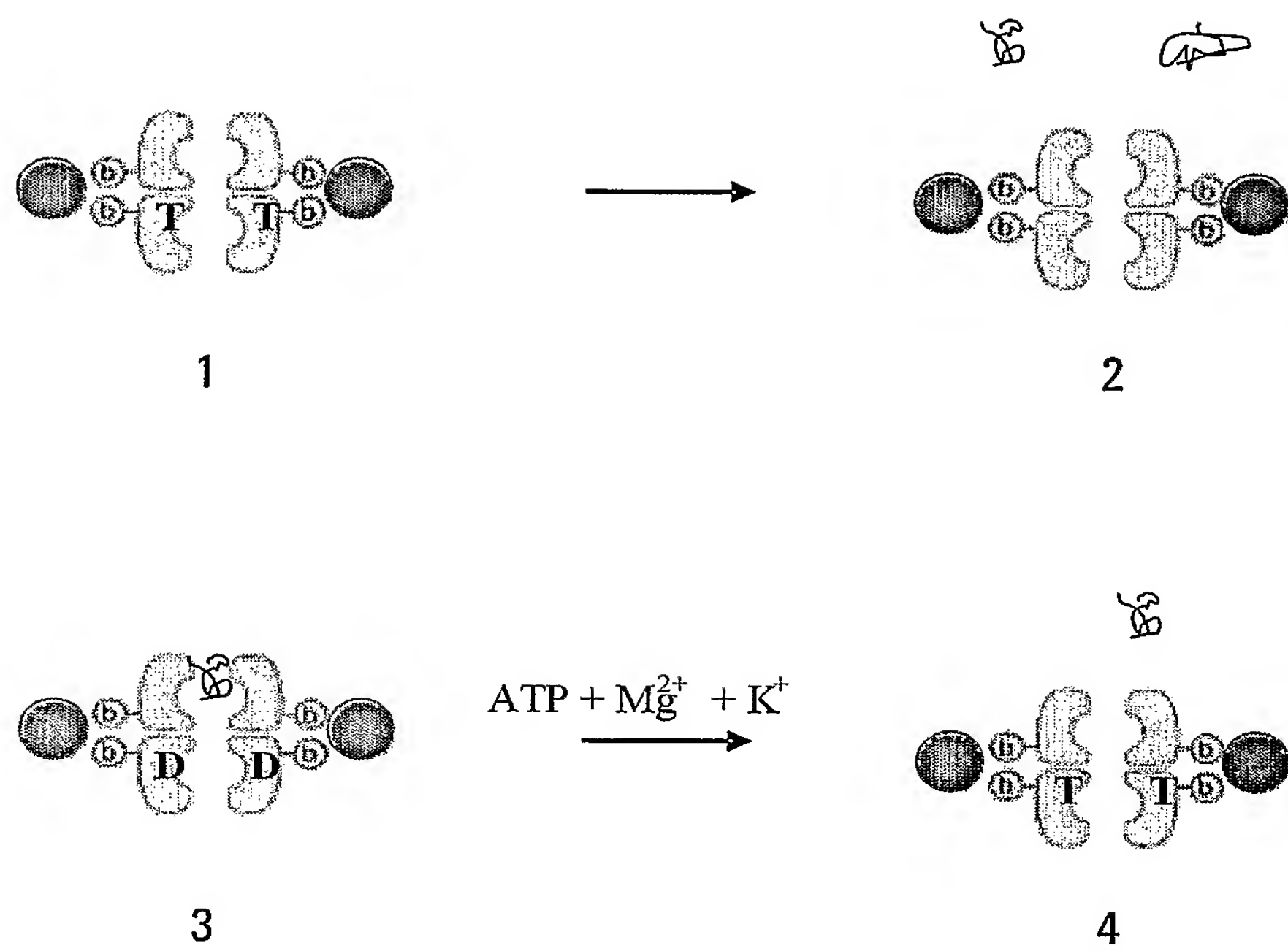


FIG. 10